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לכתחילה עם הבקשה
לפטנט לפי הפרטים
הרשומים בעמוד הראשון
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חוק הפטנטים, התשכ"ז-1967
PATENTS LAW, 5725-1967
ב ק ש ה ל פ ט נ ט
Application for Patent

לשימוש הלשכה
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144800	מספר : Number
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אני (שם המבקש, מענו - ולגבי גוף מאוגד - מקום התאגדותו)
I (Name and address of applicant, and, in case of a body corporate, place of incorporation)
שורש ערכות נוודים בע"מ, ת.ד. 32 טירת הכרמל, ישראל

Source Vagabond Systems LTD. P.O.B. 32 Tirat Ha'Carmel, Israel

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התקן אטימה למיכל נוזלים גמיש (בעברית)
(Hebrew)

SEALING DEVICE FOR FLEXIBLE LIQUID CONTAINER (באנגלית)
(English)

הממציאים: יורם גיל, מחורב 71 א' חיפה, ישראל

The Inventor/s: GILL, Yoram of 71A Horev St., Haifa, Israel

מבקש בזאת כי ינתן לי עליה פטנט. Hereby apply for a patent to be granted to me in respect thereof

*דרישת דין קדימה Priority Claim		*בקשת פטנט מוסף- Application for Patent of Addition		*בקשת חלוקה Application for Division
מדינת האיגוד Convention Country	תאריך Date	מספר/סימן Number/Mark	*לבקשה/לפטנט to Patent/Appl. No. 139801 מס'	מבקשת פטנט from Application No. מס'
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התקן אטימה למיכל נוזלים גמיש

SEALING DEVICE FOR FLEXIBLE LIQUID CONTAINER

SEALING DEVICE FOR FLEXIBLE LIQUID CONTAINER

FILED OF THE INVENTION

5

The present invention relates to liquid containers. More particularly, the present invention relates to a liquid container provided with a sealer that is adapted to close a wide opening in the container.

This application is an application for a patent-of-addition corresponding
10 to IL patent application no. 139801 filed on 21 of November 2000.

BACKGROUND OF THE INVENTION

15

Personal hydration systems are known in the art and are used extensively by people that are active in sports, trekking activities, recreational activities as well as in the military. Over the last decade, people in general and especially people that are active in physical activities became aware of the fact that drinking during physical activity is crucial from health considerations.

20

Therefore, personal hydration systems were developed over the years and since the use of soft polymers such as polyurethane became applicable in designing the drinking containers of the hydration systems, flexible containers, bladder-like containers, became widely used. An example for a personal hydration system is shown in US 5,816,457 "hydration system" by Croft, filed
25 in 1996. This patented hydration system for backpackers or other athletes

25

includes a bladder, a filling opening, an enclosing cover and filling opening, a flexible line and a deformable valve to be held in the user's mouth. Another hydration system was invented by the inventor of the present invention (Gill Yoram and Ezer Asaf) and disclosed in PCT patent application no.
30 PCT/IL97/00263 (filed in the US as 09/297,384) "Flexible Container for Storing and Dispensing Liquids". This flexible container comprises an inner bag and at least one outer bag, and liquid dispensing means.

30

One of the problems stemming from the use of flexible polymers in the design of hydration containers is that they are not easily cleaned. The soft polymer itself is a material that may absorb matter from the liquid, especially if the liquid filled in the container is juice or tea or other sugar containing liquid.

5 In addition, the container is soft and has welded areas, therefore residues of the liquid that was inside the container may be left in corners formed in the sides of the container. Cleaning becomes a problem even when using the opening of the container from which the container is filled by liquid since this opening is usually relatively small. Accessories for cleaning flexible containers
10 are available (can be purchased in the markets) but still, the maintenance of the container is difficult.

Most of the flexible containers are made from two flexible sheets of polymer welded together from all sides while an opening for filling the container and drinking from it is formed on the side of the container in the
15 surface of one of the sheets. One of the solutions for the maintenance problem in those types of flexible containers is to leave a large opening on one of the sides of the container by leaving an unwelded area. It is straightforward that the unwelded area that acts as an opening is in the narrower side of the container while it becomes very easy to clean the interior
20 of the container by inserting a hand into it. Moreover, it is easy to dry the container after cleaning is finished and there is no need for expensive cleaning and drying accessories.

Leaving an unwelded area to be used as an opening for cleaning the container brought about another problem. The ability to hermetically seal this
25 opening when the container is in use and filled with liquid is diminished. In available solutions, the container is prone to liquid leakage and the container has to be positioned so that the opening is in the upper side of the container at all times. This fact prevents the free use of the container to many of the application that these containers are designed for. There is a need to provide
30 an easy way to close the hydration container so that the container is completely sealed when in use. Moreover, when the container is safely sealed, it may be placed in any orientation without leakage.

SUMMARY OF THE INVENTION

5 It is an object of the present invention to provide a flexible personal hydration container provided with a sealer that hermetically closes a wide opening in the container.

 It is yet another object of the present invention to provide a flexible personal container provided with a sealer that safely secures and closes an
10 opening in the container so that liquid from the container would not leak even when the container is full and even if the container is positioned with the opening in its bottom.

 Yet, it is another object of the present invention to provide a flexible personal container provided with a sealer that closes a relatively wide opening
15 that is large enough so that the opening may be used in order to fill liquid into the container and clean the container.

 It is a further object of the present invention to provide a container provided with a sealer that is durable in extensive out-door activity.

 Further, it is another object of the present invention to provide a flexible
20 hydration container provided with a sealer that is cheap and easy to use.

 It is thus provided a sealing device adapted to seal a flexible liquid container having a cavity for receiving liquids, a lateral opening for filling the container with liquids, and a liquid dispensing outlet, said sealing device comprising:

25 a rod having a first end and a second end, provided laterally across the flexible container so that a portion of the container adjacent the lateral opening can be folded over the rod and substantially overlap an adjacent portion of the container; and

 a sealer comprising an elongated member having two opposite sides
30 along which a hollow passage is extended with a longitudinal slot, wherein the sealer is provided with an opening on at least one of the opposite sides, and wherein said sealer is slidably mountable

over said rod, wherein the space defined within the passage is not smaller than the total space occupied by the portion of the container provided with the lateral opening folded over the rod and the rod itself when inserted in the passage, and wherein the slot is not narrower than the total thickness of the folded portion of the container and the adjacent portion when inserted through the slot, whereby when the portion of the container provided with the lateral opening is folded over the rod, substantially overlapping an adjacent portion of the container and the sealer is slidingly mounted over the folded portion of the container and the rod, liquid is prevented from leaking out of the container through the lateral opening.

Furthermore, in accordance with another preferred embodiment of the present invention, the length of said rod is larger than the lateral opening of the container.

Furthermore, in accordance with another preferred embodiment of the present invention, the first end of the rod is provided with a resilient lateral protrusion and the second end of the rod is provided with a stopper having a diameter that is larger than a diameter of the passage of said sealer.

Furthermore, in accordance with another preferred embodiment of the present invention, said rod is attached to the flexible container.

Furthermore, in accordance with another preferred embodiment of the present invention, said rod is welded to the flexible container.

Furthermore, in accordance with another preferred embodiment of the present invention, the flexible container is formed from two adjacent films of polymeric material having a majority of their perimeter welded, and wherein the lateral opening is a portion of the unwelded perimeter.

Furthermore, in accordance with another preferred embodiment of the present invention, said passage has a horse-shoe-like cross-section, and wherein the cross-section is substantially constant along said elongated member.

Furthermore, in accordance with another preferred embodiment of the present invention, said rod has substantially elliptic cross section.

Furthermore, in accordance with another preferred embodiment of the present invention, said sealer is made from a rigid polymer, said
5 rigid polymer selected from ABS and acetal polypropylene.

Furthermore, in accordance with another preferred embodiment of the present invention, there is provided a sealable flexible liquid container comprising

- 10 a flexible liquid container having a cavity for receiving liquids, a lateral opening for filling the container with liquids, and a liquid dispensing outlet;
- 15 a rod having a first end and a second end, provided laterally across the flexible container so that a portion of the container adjacent the lateral opening can be folded over the rod and substantially overlap an adjacent portion of the container; and
- 20 a sealer comprising an elongated member having two opposite sides along which a hollow passage is extended with a longitudinal slot, wherein the sealer is provided with an opening on at least one of the opposite sides, and wherein said sealer is slidably mountable over said rod, wherein the space defined within the passage is not smaller than the total space occupied by the portion of the container provided with the lateral opening folded over the rod and the rod itself when inserted in the passage, and wherein the slot is not narrower than the total thickness of the folded portion of the
25 container and the adjacent portion when inserted through the slot, whereby when the portion of the container provided with the lateral opening is folded over the rod, substantially overlapping an adjacent portion of the container and the sealer is slidably mounted over the folded portion of the container and the rod,
30 liquid is prevented from leaking out of the container through the lateral opening.

Furthermore, in accordance with another preferred embodiment of the present invention, the flexible container is formed from two adjacent films of polymeric material having a majority of their perimeter welded, and wherein the lateral opening is a portion of the unwelded perimeter.

Furthermore, in accordance with another preferred embodiment of the present invention, one of said two adjacent films is provided with an extension that extends beyond the lateral opening.

Furthermore, in accordance with another preferred embodiment of the present invention, said extension is provided with a hole.

Furthermore, in accordance with another preferred embodiment of the present invention, the length of said rod is larger than the lateral opening of the container.

Furthermore, in accordance with another preferred embodiment of the present invention, the first end of the rod is provided with a resilient lateral protrusion and the second end of the rod is provided with a stopper having a diameter that is larger than a diameter of the passage of said sealer.

Furthermore, in accordance with another preferred embodiment of the present invention, said rod is attached to the flexible container.

Furthermore, in accordance with another preferred embodiment of the present invention, said rod is welded to the flexible container.

Furthermore, in accordance with another preferred embodiment of the present invention, the flexible container is formed from two adjacent films of polymeric material having a majority of their perimeter welded, and wherein the lateral opening is a portion of the unwelded perimeter.

Furthermore, in accordance with another preferred embodiment of the present invention, said passage has a horse-shoe-like cross-section, and wherein the cross-section is substantially constant along said elongated member.

Furthermore, in accordance with another preferred embodiment of the present invention, said rod has substantially elliptic cross section.

Finally, in accordance with another preferred embodiment of the present invention, The flexible liquid container as claimed in Claim 1, wherein said sealer is made from a rigid polymer, said rigid polymer selected from ABS and acetal polypropylene.

5

BRIEF DESCRIPTION OF THE FIGURES

Figure 1 illustrates an isometric view of a personal hydration system provided with a sealer in accordance with a preferred embodiment of the present invention, in an open state.

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Figure 2 illustrates an isometric view of the personal hydration system provided with a sealer shown in Figure 1, partially closed.

15

Figure 3 illustrates an isometric view of the personal hydration system provided with a sealer shown in Figure 1, fully sealed.

DETAILED DESCRIPTION OF THE INVENTION AND THE FIGURES

20

The unique seal of the present invention is adapted to hermetically seal personal hydration containers having an opening that is relatively large so as to enable easy filling and easy cleaning of the container through the opening. The seal prevents leakage of liquid from the container, no matter what the orientation of the container is. Therefore, the container may be positioned in any orientation as well as on its side without leakage.

25

Reference is now made to Figure 1 illustrating an isometric view of a personal hydration system provided with a sealer in accordance with a preferred embodiment of the present invention, in an open state. A flexible container 100 is a flat container that is made from a polymeric material such as polyurethane, PVC, or polyethylene. Container 100 is made from two films

30

of polymeric material that are welded together at three sides of the container, near its perimeter. The fusion is performed by conventional methods such as ultrasonic high frequency or heat. The welded sides of the films form a cavity that is adapted to receive liquids. At one of the narrower sides of container 5 100, the perimeter is not welded so that an opening 102 is formed. Opening 102 is a large opening relative to the openings that are usually available in such containers so that the container may be filled conveniently and the user may clean the container by inserting his hand palm into the container. One of the polymeric films has an extension 104 that enables the user to handle the 10 container while filling it or while cleaning it. Extension 104 provides also a gripping portion for the container, therefore, a hole 106 is provided in extension 104. Hole 106 may be used in order to suspend container 100 when it is stored or when the container is being cleaned or dried.

Container 100 is provided with a liquid dispensing opening 108 in one 15 side, close to the bottom of the container. Liquid dispensing opening 108 is connected to a flexible drinking pipe 110. At the proximal side of drinking pipe 110, a drinking valve 112 is provided.

Substantially parallel and close to opening 102, an elongated rod 114 is provided. Elongated rod 114 is preferably made of a relatively flexible yet rigid 20 enough polymeric material that is laterally attached to container 100 and preferably welded to it. A separated sealer 116 is provided. Sealer 116 comprises an elongated member 118 having substantially horse-shoe-shaped cross-section and is adapted to internally accommodate rod 114. Rod 114 can be inserted or pulled out from the interior of elongated member 118 only 25 by sliding the rod through the side openings of the internal cavity in elongated member 118. The rod's diameter is too large so as to be pulled out through the slot along the internal cavity of the elongated member. Sealer 116 further comprises a handle 120 that is design so as to enable the user to comfortably deal with the sealer. Handle 120 facilitates the user to hold the sealer and 30 slide elongated member 118 onto rod 114. Sealer 116 is preferably made of a rigid polymeric material such as acetal polypropylene or ABS.

In order to seal container 100, extension 104 is wrapped over rod 114 and elongated member 118 is slidably mounted over rod 114 and the wrap. As mentioned herein before, elongated member 118 is mounted over the rod by sliding the rod and wrap into the cavity of elongated member 118 from one of its sides. Rod 114 has two ends, the first end is provided with a lateral protrusion 122 and the second end is provided with a stopper 124. In order to slidably mount elongated member 118 onto rod 114, lateral protrusion 122 is threaded into the interior of elongated member 118 through an opening 126 in the member. Elongated member 118 can be mounted on rod 114 only through the end provided with lateral protrusion 122. Lateral protrusion 122 may be inserted through opening 126 while stopper 124, on the other end of rod 114, can not be inserted through opening 126. In a preferred embodiment of the present invention the space defined within the passage in the sealer is not smaller than the total space occupied by the portion of the container provided with the lateral opening folded over the rod and the rod itself when inserted in the passage, and the slot is not narrower than the total thickness of the folded portion of the container and the adjacent portion when inserted through the slot.

Reference is now made to Figure 2, illustrating an isometric view of the personal hydration system provided with a sealer shown in Figure 1, partially closed. After extension 104 is folded over rod 114, opening 126 of elongated member 118 is mounted onto lateral protrusion 122 and elongated member 118 is sliding onto rod 114. Opening 126 is provided with a broadening in the part where the fold passes through so that the threading of the rod and the fold through elongated member 118 is made easier.

Reference is now made to Figure 3 illustrating an isometric view of the personal hydration system provided with a sealer shown in Figure 1, fully sealed. Sealer 116 is fully sliding onto rod 114 (can not be seen in Figure 3, fully inserted in elongated member 118). Stopper 124 stops sealer 116 from proceeding outwardly from rod 114. In the fully sealed state, sealer 116 is restrained in the position shown in the figure since from one side, stopper 124 restrains it and from the other side, lateral protrusion 122 prevents sealer 116

from sliding back through it. When Container 100 is to be opened, lateral protrusion 122 has to be laterally pushed in order to enable the protrusion to pass through opening 126. Therefore, the length of sealer 116 is slightly less than the length of rod 114 but it is designated so that end 126 is adjacent to stopper 124 while the second opening of elongated member 118 is adjacent to lateral protrusion 122. In this way, the sealer completely seals the container.

It is preferable to design elongated rod 114 so that its cross section will be elliptic rather than circular and will be positioned with the ellipse elongated diameter parallel to the plane of the polymeric film. In this way, the rod is positioned in the interior of elongated member 118 so as to establish a complete and hermetic closure of container 100.

Handle 120 is provided with a hole 128. When sealer 116 seals container 100, hole 128 may be used in order to suspend the container.

The container is hermetically sealable if the slot through which the fold pass is slightly wider than twice the thickness of the container (the thickness of the container means the accumulative thickness of the two films that form the container). The thickness of the slot has to be optimized so that from one side it will be wide enough so that the folded container may be freely slid through the slot and from the other side, it has to be narrow enough so that water can not pass through the fold. In the same manner, the diameter of the elongated rod has to be adjusted so that the folded container may be freely inserted into the gap between the elongated member and the rod. The two films in the fold that are situated in the gap have to be tightly contiguous in order to establish a good sealing characteristic of the sealer. An example for optimized sizes of a container and a corresponding sealer are: for a container having thickness of approximately 0.9 mm (the thickness of the two films), a sealer having a slot of about 3 mm, a rod of about 3 mm in diameter and an inner passage diameter of about 11.5 mm will adapt to sealingly block the passage of liquid from the liquid receiving cavity through the fold while at the same time the insertion of the fold into the cylinder is easy.

It should be clear that the description of the embodiments and attached Figures set forth in this specification serves only for a better understanding of the invention, without limiting its scope as covered by the following Claims.

5 It should also be clear that a person in the art, after reading the present specification could make adjustments or amendments to the attached Figures and above described embodiments that would still be covered by the following Claims.

CLAIMS

1. A sealing device adapted to seal a flexible liquid container having a cavity for receiving liquids, a lateral opening for filling the container with liquids, and a liquid dispensing outlet, said sealing device comprising:
 - a rod having a first end and a second end, provided laterally across the flexible container so that a portion of the container adjacent the lateral opening can be folded over the rod and substantially overlap an adjacent portion of the container; and
 - a sealer comprising an elongated member having two opposite sides along which a hollow passage is extended with a longitudinal slot, wherein the sealer is provided with an opening on at least one of the opposite sides, and wherein said sealer is slidingly mountable over said rod, wherein the space defined within the passage is not smaller than the total space occupied by the portion of the container provided with the lateral opening folded over the rod and the rod itself when inserted in the passage, and wherein the slot is not narrower than the total thickness of the folded portion of the container and the adjacent portion when inserted through the slot, whereby when the portion of the container provided with the lateral opening is folded over the rod, substantially overlapping an adjacent portion of the container and the sealer is slidingly mounted over the folded portion of the container and the rod, liquid is prevented from leaking out of the container through the lateral opening.
2. The sealing device as claimed in Claim 1, wherein the length of said rod is larger than the lateral opening of the container.

3. The sealing device as claimed in Claim 1, wherein the first end of the rod is provided with a resilient lateral protrusion and the second end of the rod is provided with a stopper having a diameter that is larger than a diameter of the passage of said sealer.
4. The sealing device as claimed in Claim 1, wherein said rod is attached to the flexible container.
5. The sealing device as claimed in Claim 1, wherein said rod is welded to the flexible container.
6. The sealing device as claimed in Claim 1, wherein the flexible container is formed from two adjacent films of polymeric material having a majority of their perimeter welded, and wherein the lateral opening is a portion of the unwelded perimeter.
7. The sealing device as claimed in Claim 1, wherein said passage has a horse-shoe-like cross-section, and wherein the cross-section is substantially constant along said elongated member.
8. The sealing device as claimed in Claim 1, wherein said rod has substantially elliptic cross section.
9. The sealing device as claimed in Claim 1, wherein said sealer is made from a rigid polymer, said rigid polymer selected from ABS and acetal polypropylene.
10. A sealable flexible liquid container comprising

a flexible liquid container having a cavity for receiving liquids, a lateral opening for filling the container with liquids, and a liquid dispensing outlet;

a rod having a first end and a second end, provided laterally across the flexible container so that a portion of the container adjacent the lateral opening can be folded over the rod and substantially overlap an adjacent portion of the container; and

a sealer comprising an elongated member having two opposite sides along which a hollow passage is extended with a longitudinal slot,

wherein the sealer is provided with an opening on at least one of the opposite sides, and wherein said sealer is slidingly mountable over said rod, wherein the space defined within the passage is not smaller than the total space occupied by the portion of the container provided with the lateral opening folded over the rod and the rod itself when inserted in the passage, and wherein the slot is not narrower than the total thickness of the folded portion of the container and the adjacent portion when inserted through the slot,

whereby when the portion of the container provided with the lateral opening is folded over the rod, substantially overlapping an adjacent portion of the container and the sealer is slidingly mounted over the folded portion of the container and the rod, liquid is prevented from leaking out of the container through the lateral opening.

11. The flexible liquid container as claimed in Claim 10, wherein the flexible container is formed from two adjacent films of polymeric material having a majority of their perimeter welded, and wherein the lateral opening is a portion of the unwelded perimeter.

12. The flexible liquid container as claimed in Claim 11, wherein one of said two adjacent films is provided with an extension that extends beyond the lateral opening.

13. The flexible liquid container as claimed in claim 12, wherein said extension is provided with a hole.

5

14. The flexible liquid container as claimed in Claim 1, wherein the length of said rod is larger than the lateral opening of the container.

10

15. The flexible liquid container as claimed in Claim 1, wherein the first end of the rod is provided with a resilient lateral protrusion and the second end of the rod is provided with a stopper having a diameter that is larger than a diameter of the passage of said sealer.

15

16. The flexible liquid container as claimed in Claim 1, wherein said rod is attached to the flexible container.

17. The flexible liquid container as claimed in Claim 1, wherein said rod is welded to the flexible container.

20

18. The flexible liquid container as claimed in Claim 1, wherein the flexible container is formed from two adjacent films of polymeric material having a majority of their perimeter welded, and wherein the lateral opening is a portion of the unwelded perimeter.

25

19. The flexible liquid container as claimed in Claim 1, wherein said passage has a horse-shoe-like cross-section, and wherein the cross-section is substantially constant along said elongated member.

30

20. The flexible liquid container as claimed in Claim 1, wherein said rod has substantially elliptic cross section.

21. The flexible liquid container as claimed in Claim 1, wherein said sealer
is made from a rigid polymer, said rigid polymer selected from ABS and
acetal polypropylene.

22. A sealing device adapted to seal a flexible liquid container having a
cavity for receiving liquids, a lateral opening for conveniently filling liquid
as well as providing easy excess for cleaning, and a liquid dispensing
opening, substantially as disclosed in the above specification, Figures
and Claims.

23. A flexible liquid container with a sealing device adapted to seal a
flexible liquid container having a cavity for receiving liquids, a lateral
opening for conveniently filling liquid as well as providing easy excess
for cleaning, and a liquid dispensing opening, substantially as disclosed
in the above specification, Figures and Claims.

For the applicant
Miller-Sieradzki
Advocates & patent Attorneys

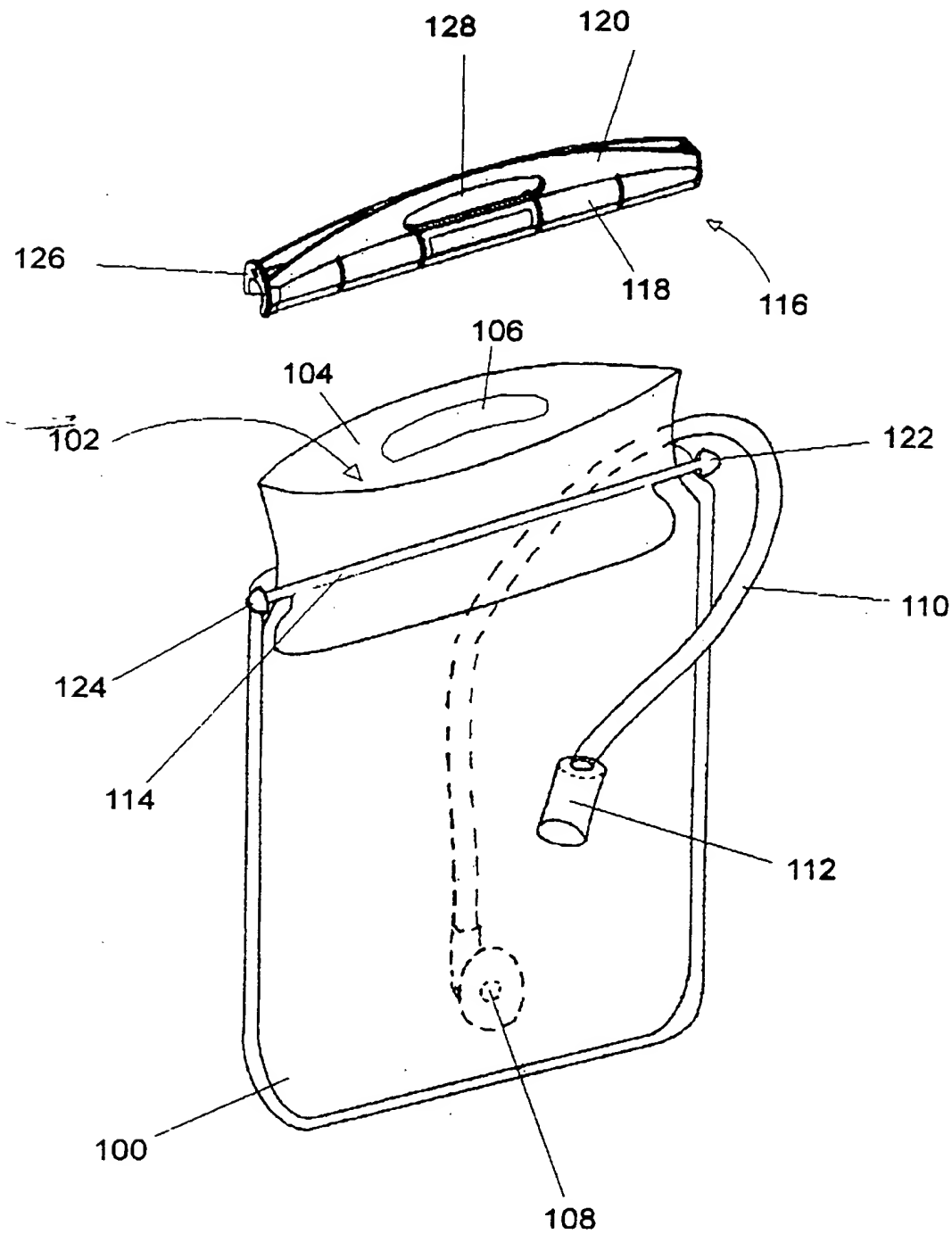


Figure 1

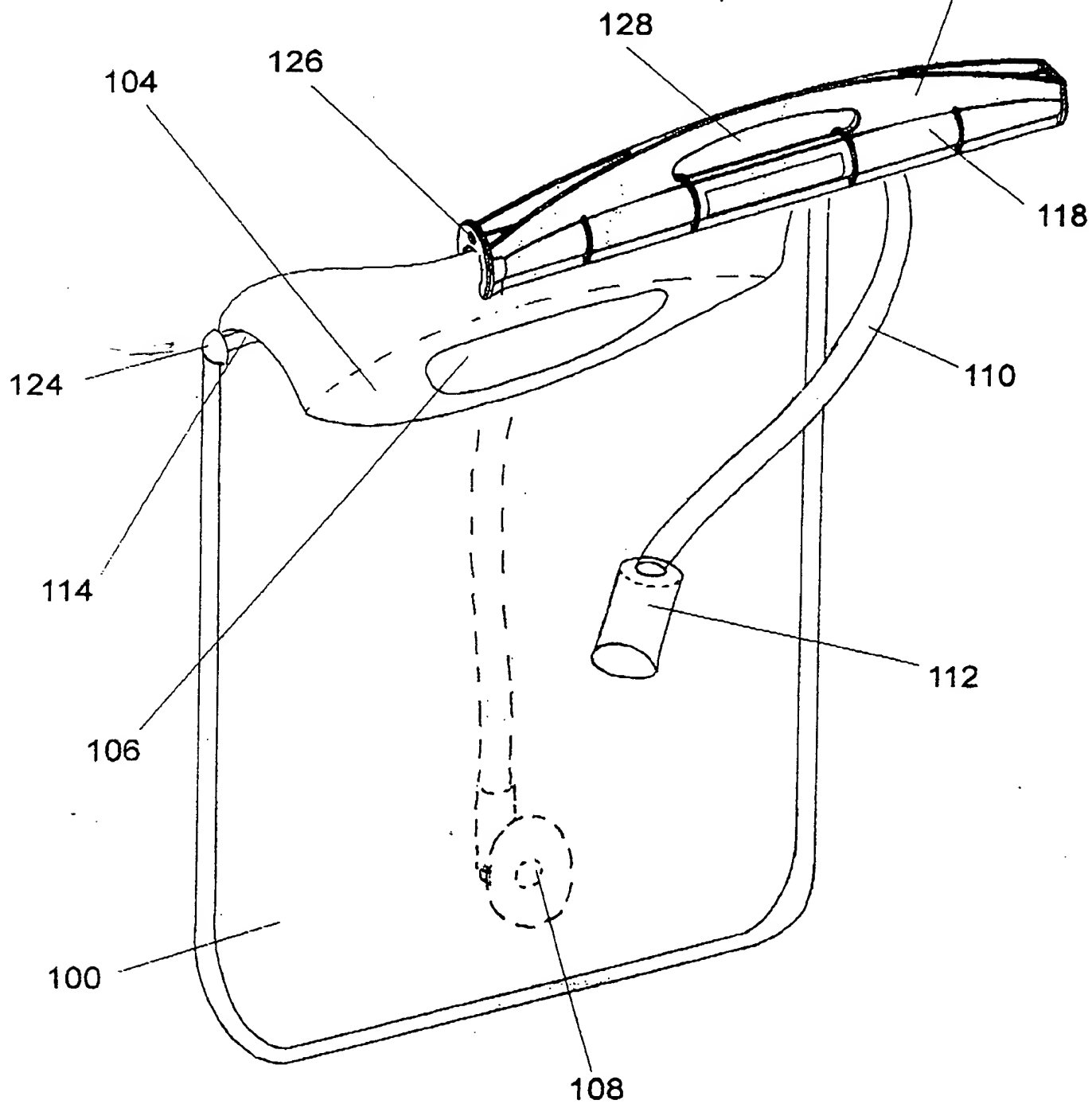


Figure 2